

PSS curs 8

$$0101 = 5$$

$$0101 = 5/16$$

Exercitii 1, 2, 3 / 6, 8

(1)

$$\begin{matrix} 2^4 & 2^3 & 2^2 & 2^1 & 2^0 & 2^{-1} & 2^{-2} & 2^{-3} & 2^{-4} \\ 1 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 \end{matrix}$$

(fara semn) (05514F)

$$(2^4 + 2^3 + 2 + 1), (2^{-2} + 2^{-4}) = 27,3125$$

$$\frac{1}{4} + \frac{1}{16} = \frac{5}{16}$$

(2) 273.21875 → 1S 1016F

$$\begin{matrix} 2^8 & 2^4 & 2^0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 1 \end{matrix}, \begin{matrix} 2^0 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{matrix}$$

$$273 = 256 + 16 + 1$$

$$= 2^8 + 2^4 + 2^0$$

$$0.21875 \times 2 = 0.43750$$

$$0.43750 \times 2 = 0.8750$$

$$0.875 \times 2 = 1.75$$

$$0.75 \times 2 = 1.5$$

$$0.5 \times 2 = 1.0$$

$$0 \times 2 = 0$$

$$0 \times 2 = 0$$

$$0 \times 2 = 0$$

$$22.21875 = \begin{matrix} 2^2 & 2^1 & 2^0 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \end{matrix}, \begin{matrix} 2^0 & 2^{-1} & 2^{-2} & 2^{-3} & 2^{-4} \\ 0 & 0 & 1 & 1 & 1 & 0 \end{matrix}$$

(3)

$$1S 616F$$

$$-22 = ?$$

$$22 = 16 + 4 + 2 = 2^4 + 2^2 + 2^1$$

$$\begin{matrix} 2^8 & 2^4 & 2^0 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \end{matrix}, \begin{matrix} 2^0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{matrix} (22)$$

$$-22 \rightarrow \text{M.S.} : \begin{matrix} 2^8 & 2^4 & 2^0 \\ 1 & 0 & 1 & 0 & 1 & 1 & 0 \end{matrix}, \begin{matrix} 2^0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{matrix} (-22, \text{M.S.})$$

$$C1 : \begin{matrix} 2^8 & 2^4 & 2^0 \\ 1 & 1 & 0 & 1 & 0 & 0 & 1 \end{matrix}, \begin{matrix} 2^0 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 \end{matrix} (-22, C1)$$

$$C2 : \begin{matrix} 2^8 & 2^4 & 2^0 \\ 1 & 1 & 0 & 1 & 0 & 0 & 1 \end{matrix}, \begin{matrix} 2^0 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 \end{matrix} +$$

$$\begin{matrix} 2^8 & 2^4 & 2^0 \\ 1 & 1 & 0 & 1 & 0 & 1 & 0 \end{matrix}, \begin{matrix} 2^0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{matrix} (-22, C2)$$

$$-22.21875 \rightarrow \text{M.S.} : \begin{matrix} 2^8 & 2^4 & 2^0 \\ 1 & 0 & 1 & 0 & 1 & 1 & 0 \end{matrix}, \begin{matrix} 2^0 \\ 0 & 0 & 1 & 1 & 1 & 1 & 0 \end{matrix} (\text{M.S.})$$

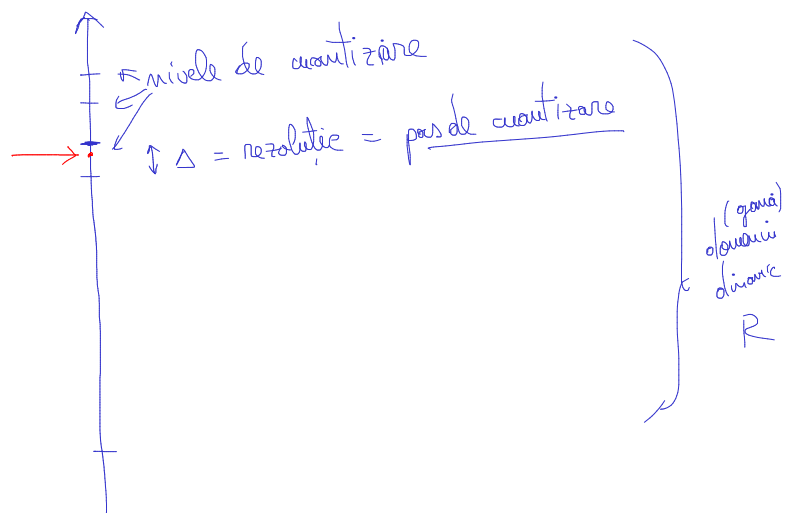
$$C1 : \begin{matrix} 2^8 & 2^4 & 2^0 \\ 1 & 0 & 1 & 0 & 0 & 1 & 1 \end{matrix}, \begin{matrix} 2^0 \\ 1 & 1 & 0 & 0 & 0 & 1 & 1 \end{matrix} (-22.21875, C1)$$

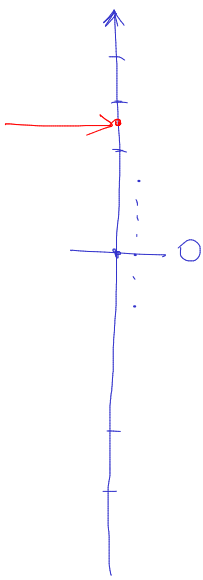
$$C2 : \begin{matrix} 2^8 & 2^4 & 2^0 \\ 1 & 0 & 1 & 0 & 0 & 1 & 1 \end{matrix}, \begin{matrix} 2^0 \\ 1 & 1 & 0 & 0 & 0 & 1 & 1 \end{matrix} +$$

$$\begin{matrix} 2^8 & 2^4 & 2^0 \\ 1 & 1 & 0 & 1 & 0 & 0 & 1 \end{matrix}, \begin{matrix} 2^0 \\ 1 & 1 & 0 & 0 & 1 & 1 & 0 \end{matrix} (-22.21875, C2)$$

$$\textcircled{1} \{x[n]\} = x[n] \text{ cuantizat}$$

$$\{x[n]\}_Q$$





Exercitiul 4/Lab 8

(4) $x_L = 0.42625$

$x_2 = -0.4333$

vg. fixat 15014F

$x_L = 0.42625$

$= \frac{0.42625 \cdot 16}{16}$

$= \frac{6.82}{16}$

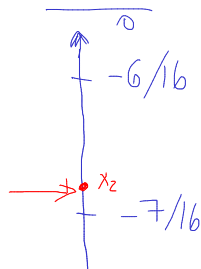
$[x_1]_R = \frac{7}{16} = 0.4375 = \frac{0}{5}, 0111$

$[x_1]_T = \frac{6}{16} = 0.375 = \frac{0}{5}, 0110$

$[x_1]_{Tsv} = \frac{6}{16} = 0.375 = \text{---}$

$x_2 = -0.4333$

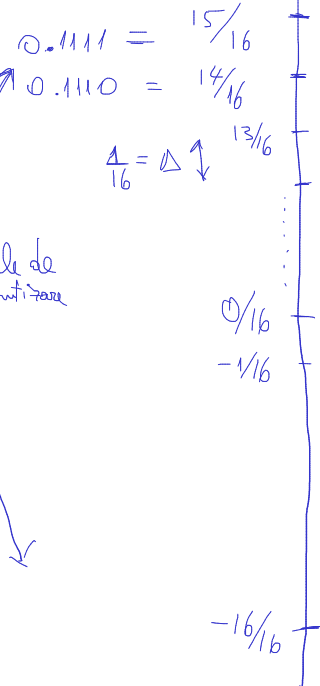
$= \frac{-6.93}{16}$



$[x_2]_R = -\frac{7}{16} = -0.4375 = \frac{1}{5}, 1001$

$[x_2]_T = -\frac{7}{16} = \text{---}$

$[x_2]_{Tsv} = -\frac{6}{16} = -0.375 = \frac{1}{5}, 1010$



32 nivele de cuantizare

Eroarea de cuantizare

$E = x_q - x$

Rotunjire:

$E_R \in \left[-\frac{\Delta}{2}, \frac{\Delta}{2}\right]$

Trunchiere:

$E_T \in [-\Delta, 0]$

$x_q - x = E \in (-0.5, 0.5]$

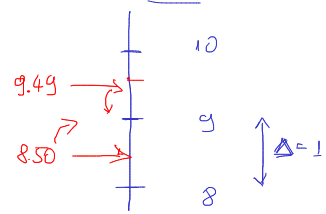
T.s.v.:

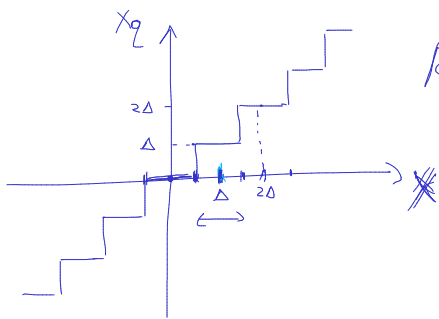
$E_{Tsv} : x \geq 0 : [-\Delta, 0]$

$x < 0 : [0, \Delta]$

Global: $[-\Delta, \Delta]$

Note:





Rotunjire

$$X = \underline{M} \cdot 2^{\underline{E}}$$

$$\underline{0.75010...}$$

$$= \cancel{0.75} \cdot 2^5$$

$$0.75$$

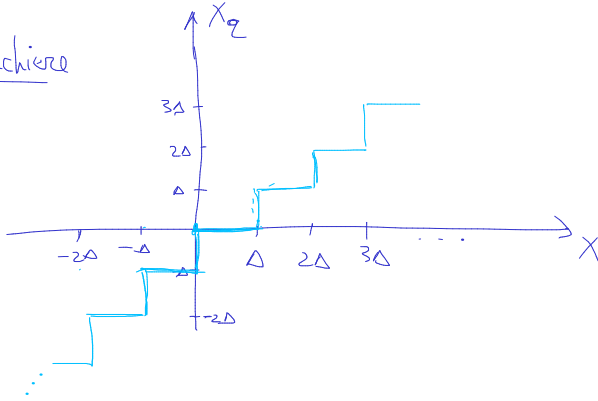
$$0.02 \cdot 2^5$$

0.75 \cdot ~~km~~

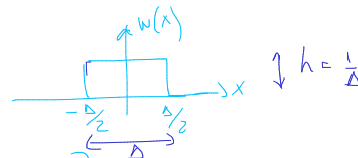
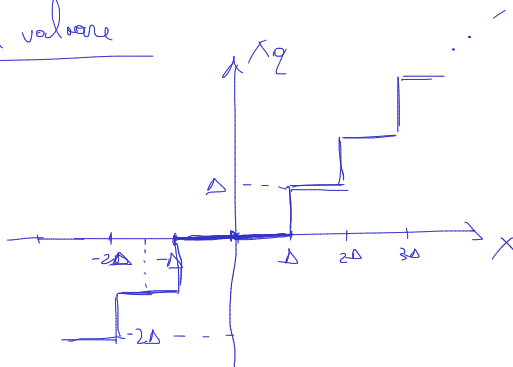
0.76 \cdot ~~km~~

0.01 \cdot ~~km~~

Tranchiere



Tranchiere semi valoare



Puterea zg. de montiz. prin rotunjire

$$\overline{E_r^2} = \overline{X^2} = \underbrace{\mu^2 + \sigma^2}_{0} = \sigma^2 = \int_{-\infty}^{\infty} x^2 \cdot w(x) dx = \int_{-\Delta/2}^{\Delta/2} x^2 \cdot \frac{1}{\Delta} dx = \frac{1}{\Delta} \cdot \frac{x^3}{3} \bigg|_{-\Delta/2}^{\Delta/2}$$

$$\boxed{\mu=0}$$

$$= \frac{1}{3 \cdot \Delta} \left(\frac{\Delta^3}{8} + \frac{\Delta^3}{8} \right) = \frac{1}{3\Delta} \cdot \frac{\Delta^3}{4} = \frac{\Delta^2}{12} = \sigma^2 = \text{puterea zg.}$$

Puterea zg. de mont. la tranch. s-v.

$$\overline{E_{TSV}^2} = \overline{X^2} = \int_{-\Delta}^{\Delta} x^2 \cdot \frac{1}{2\Delta} dx = \frac{1}{2\Delta} \cdot \frac{x^3}{3} \bigg|_{-\Delta}^{\Delta} = \frac{1}{6\Delta} \cdot (\Delta^3 + \Delta^3) = \frac{\Delta^2}{3}$$

$$\boxed{\mu=0}$$

Puteroo zg. de coastit. la tranchiera:

$$\overline{E_t^2} = \overline{X^2} = (\mu^2 + \sigma^2) = \int_{-\Delta}^0 x^2 \frac{1}{\Delta} dx = \frac{1}{\Delta} \cdot \frac{x^3}{3} \Big|_{-\Delta}^0 = \frac{1}{3\Delta} (0 + \Delta^3) = \frac{\Delta^2}{3}$$

$$\boxed{\mu = -\frac{\Delta}{2}}$$

(~~Puteroo~~
zg.)